

Keeping
it Clean



StormWater
MANAGEMENT

**Storm Water Management Program
Self-Assessment for
Rochester, Minnesota**

**National Pollutant Discharge Elimination System
Municipal Separate Storm Sewer Permit**

March 2003

Introduction

The City of Rochester completed a self-assessment process in order to develop a Phase II storm water management approach well suited to Rochester's specific situation. This self-assessment process created the baseline information used to guide the development of the permit application and Storm Water Pollution Prevention Program. Documentation of that process also sets the "Maximum Extent Practicable" framework for the City's decision-making. As part of this process, the City identified the:

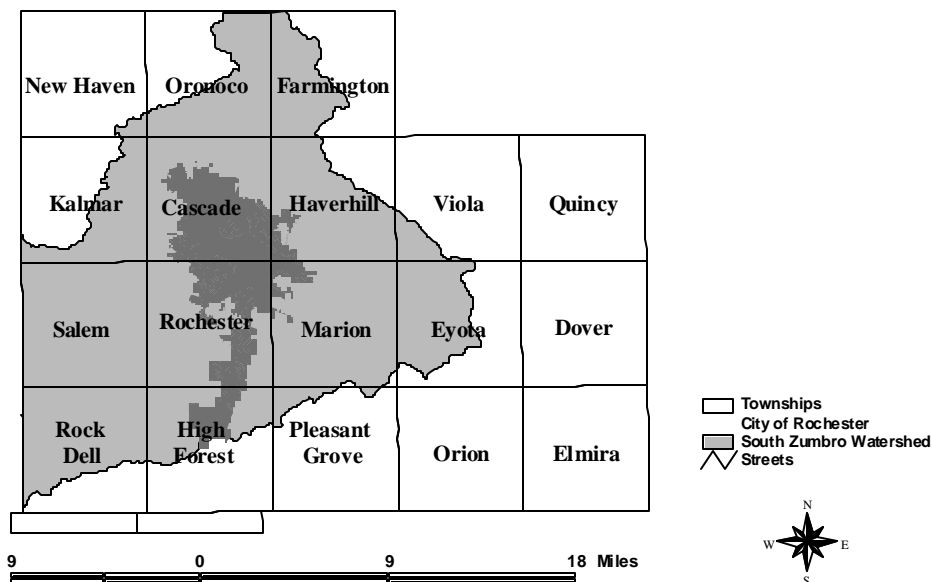
1. Characteristics of the South Zumbro River Watershed (SZRW), as they relate to specifically to the City and it's future urban service areas,
2. Organizational perspectives of the City of Rochester,
3. Overall Storm Water Management and Water Quality Philosophy
4. Issues related to storm water management,
5. Current activities used to manage storm water,
6. Gaps between the current and Phase II storm water programs, and
7. Future storm water management priorities.

The following sections describe each of these aspects in more detail.

1.0 Characteristics of the South Zumbro River Watershed

The types of surface water features that exist in the SZRW are a function of the natural physical and geographical conditions in conjunction with constructed features associated with local land-use conditions. These factors also affect water quality within the watershed. The following map shows the extent of the SZRW within Olmsted County, along with political boundaries for the City and townships.

Township Jurisdictions within the South Zumbro Watershed

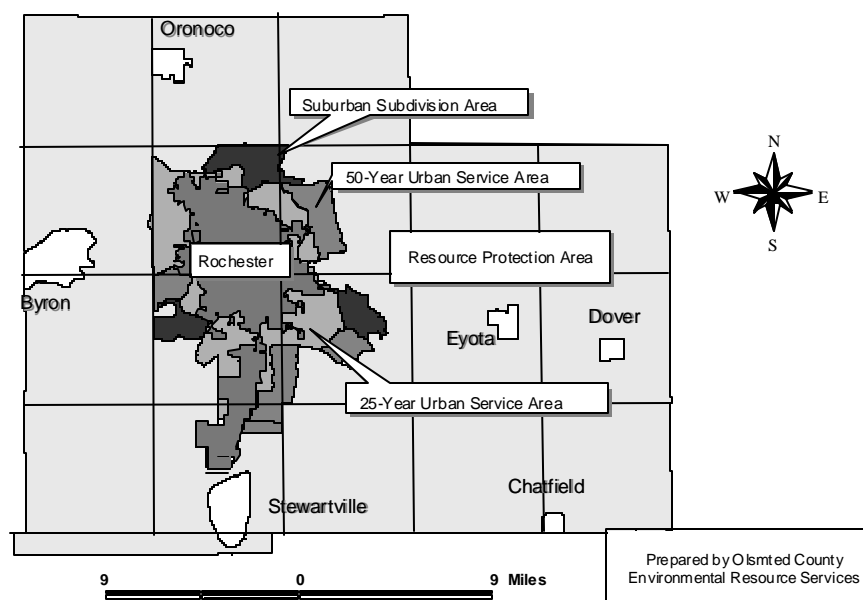


Source: Decorah Edge Study Summary, Olmsted County Environmental Services (4/25/01)

The entire SZRW drains a 243,000-acre area in Olmsted and Dodge Counties. As can be seen in the map above, most of the watershed (77% or 186,000 acres) is within Olmsted County. With the exception of approximately 40 acres of agricultural land located at its southernmost extremity, the City is located within the SZRW.

The City growth areas within the SZRW are denoted as 25-year and 50-year urban service areas, as shown on the following map. There are also areas outside the City that are designated as Suburban Subdivision Areas that are slated for very low-density residential development. The remainder of the SZRW is comprised of other small cities and resource (or agricultural) protection areas. The following SZRW characterization will focus on the City of Rochester and its urban service areas.

Land Use Designations in the Area Around the City of Rochester



Source: Decorah Edge Study Summary, Olmsted County Environmental Services (4/25/01)

Rochester is primarily situated within an open basin that has been created by a system of creeks and rivers. The primary drainage system within the SZRW is a dendritic network of creeks that flow into the South Zumbro River, which eventually empties into the Mississippi River near Kellogg, MN. The creeks that drain into the South Zumbro River within Rochester's Urban Service Area are: Bear Creek, Cascade Creek, King's Run, Silver Creek, Hadley Creek, and Willow Creek. Currently, approximately 12 miles of the South Fork of the Zumbro River and 53 miles of tributary creeks flow through Rochester. As Rochester grows, it will expand to the upper plateau that surrounds the central river basin.

There are no natural lakes within the SZRW, but over time, several artificial lakes have been created within the river network. Silver Lake and Lake Zumbro were constructed on the South Zumbro River as reservoirs for hydroelectric power.

production, but only Silver Lake is within the City. Chester Lake and several smaller reservoirs were constructed on outlying creeks to provide flood storage at upstream locations in the watershed as part of Rochester's flood control project. Cascade Lake is currently under development within the City as a result of aggregate mining activities and will eventually be reclaimed as an aesthetic amenity. An unknown number of miles of ravines are also an integral part of the natural drainage system.

Wetlands of various sizes and types exist within the SZRW. The City's Storm Water Management Plan (1999) classifies the wetlands into four categories, based primarily on floral diversity/integrity and wildlife habitat criteria:

- Ecosystem support – wetlands altered by human activities, but with values important to adjacent upland ecosystems or drainage to other systems,
- Natural – wetlands with generally intact remnant plant communities,
- Unique – intact wetlands with special and unusual qualities, and
- Urban – isolated wetlands that have been significantly altered or degraded.

Most wetlands within the SZRW are generally located within floodplains associated with the various creeks and rivers. Smaller wetlands appear as side hill seeps adjacent to outcroppings of the Decorah Shale bedrock unit and glacial till units that discharge ground water to the surface. Three calcareous fens have also been identified in Olmsted County. The Mutchler fen is located within City limits. The High Forest fen is outside City limits, but receives surface water drainage directly from the City.

Much of the bedrock geology in Olmsted County is denoted as a karst environment, with features in certain areas that can promote rapid infiltration of surface water to become ground water. Similarly, there are locations in and around the City where groundwater is discharged to become surface water. These discharge and recharge points typically exist within river reaches and along bedrock or glacial till outcrops. The basin in which Rochester is situated is a generally flat plain with shallow depth to ground water; approximately half of Rochester's ground water recharge occurs in this area. The remaining recharge stems from the Decorah Shale bedrock formation on the surrounding hill slopes. These hill slopes connect the lower river basin to the upper bedrock plateau.

A wide variety of soil types exist within the City, ranging from highly erodible soils on hill slopes and in flood plains to nearly impermeable glacial tills, particularly in buried bedrock valleys.

A secondary drainage system has been created through the construction of road ditches, storm water management ponds and their drainage ways, and storm sewers. Ultimately, these secondary conveyances discharge to the creeks and rivers. Within the City, an approximate inventory of the constructed drainage system is as follows:

- 280 miles of storm sewer pipe
- 4,000 storm sewer catch basin
- 2,500 storm sewer manholes

- 17 bridges and 1 box culverts
- 128 storm water ponds
- 780 lane miles of streets

The number of outfalls and culverts adjacent to receiving waters, miles of road ditches, and miles of drainage easements have not yet been inventoried. The characteristics of private storm sewer systems within the City limits are also presently unknown.

As noted earlier, the receiving waters in the Rochester urban service areas are a few artificial lakes and creeks that drain to the South Fork of the Zumbro River, which is designated for aquatic life, fishing, and swimming. One reach of the South Zumbro River (between its confluence with Cascade Lake and its confluence with the Middle Fork of the Zumbro River) has been identified by the Minnesota Pollution Control Agency as being impaired for aquatic life and swimming due to excess levels of turbidity and *fecal coliform* bacteria. Although significant portions of the SZRW are under agricultural production (known sources of topsoil loss and feedlot manure contributions), the urban portion of the SZRW also contributes to these problems. A large residential Canadian Goose population and pet waste add to the *fecal coliform* problem. Inadequate erosion control measures at construction sites add to the turbidity problems.

Land use within the entire SZRW (Dodge and Olmsted Counties) is 74% agricultural (177,390 acres), 15% urban/suburban development (65,000 acres), 8% forest, 2% water, and 1% wetland. Specifically within Rochester and its urban service areas, the land use breakdown is as follows:

Category	Total Acres	Vacant Acres*	% of Total
	By Category*	*	By Category
Farm Dwellings (5 Acre average)	400	---	1.2%
Residential	18,491	1,440	53.8%
Parks & Open Space	6,353	---	*18.5%
Schools, Churches & Cemeteries	909	109	2.6%
Commercial	2,406	1,102	7.0%
Industrial	2,584	1,308	7.5%
Medical, Government, Utilities	709	38	2.1%
Mining	717	---	2.1%
Airport	1,828	---	5.3%
TOTALS	34,397	3,997	100.0%

* Total acres zoned for each category.

** Portion of zoned acres not yet developed.

Source: Rochester-Olmsted Planning Department (3/02)

Rochester is one of the fastest growing cities in Minnesota. Its 2001 population was 89,325 people, which represents a change of 4.1% since 1990. Most of that growth is occurring in former agricultural areas that are newly annexed to the City.

According to the table above, approximately 12 % of the zoned acres are available to be developed as infill within annexed areas. Commercial and business areas with high percentages of impervious surface tend to be segregated from more highly landscaped residential areas.

Based on data provided by the National Weather Service on their website (www.nws.noaa.gov), the average precipitation for the Rochester area from 1961 to 1990 is 29.66 inches. The Rochester area has received above average precipitation (i.e., > 29.66 inches) during eight of the past 11 years. More specifically, precipitation amounts exhibit an increasing trend since 1950 of over 5 inches of increased rainfall on an annual basis. According to the State Climatologist, portions of southeastern Minnesota have received a cumulative precipitation departure from normal in excess of 40 inches from 1991-1999. The period 1977-1986 was also very wet when compared with the long-term data. Therefore, in spite of the 1976 drought and the 3- to 4-year drought of the late 1980's, the last 25 years in southeastern Minnesota were quite wet when compared with the first three quarters of the 20th century. The state climatologist notes that these precipitation patterns are typical and should be "treated as an inherent component of a continental climate."

2.0 Organizational Perspectives of the City of Rochester

Conditions inherent to the City of Rochester as an organization include factors such as the culture of the City, the balance between budget availability and demand for services, the size and experience of its staff, and the attitudes of its leaders and citizenry.

Rochester was founded in 1854 and its environmental protection culture has an impressive history. Since the early 1900's, it has been a consistent leader in the solid waste management, water supply, and wastewater treatment fields. Only within the last two decades, however, has the City become involved with flood control and storm water management issues. So although the City has a historically positive environmental culture, this culture has waned somewhat in recent years to a more neutral status due to other competing service demands.

When the City identifies problems, it tries to find cost-effective ways to manage them. Although Rochester is perceived as a wealthy community, City government continually struggles to meet service demands that increase disproportionately from its budget growth. That struggle is escalating due to increasing infrastructure costs and reduced federal and state aid, despite the increasing tax base from a larger population, which adds to the difficulty of funding and implementing new programs. Although the City is still awaiting the final totals for loss in local governmental aid from the 2003 legislative session, the forecasts are for a \$3.5 million loss in the remainder of 2003 and nearly \$10 million in 2004. As a result, Rochester will need to be even more fiscally conservative in the future.

Rochester employs approximately 750 staff members that are well educated, experienced and trained, as can be demonstrated by a low staff turnover rate. These staff members provide a full array of City services, utilizing a fairly standard organizational structure, and serve of a community of nearly 90,000 citizens and over 1.5 million annual visitors. Rochester is home to technologically advanced business, primarily in the medical and computer fields. As such, it attracts a highly educated employment base. If expertise is lacking in any discipline within the City staff, there are many local resources that can be tapped to identify the appropriate equipment, methods, or technologies needed for problem solving. At this time, City staff members and its citizens are not well educated about storm water issues.

Although the Rochester Public Works Department will serve as the storm water management leader, there will be many stakeholders whose involvement will need to be fostered to implement a successful program. Several City departments will have a role and every City employee will be asked to serve as a role model both as an employee and as a citizen. Training and facilitation will be necessary to develop these cooperative and collaborative roles. Many citizens are already active in environmental protection activities through their participation in organizations such as: the Zumbro Valley Audubon Society, the Izaak Walton League, the Zumbro Land Conservancy, and the Friends of Quarry Hill Nature Center. Many other civic groups, youth groups, church organizations, neighborhood groups, and business alliances exist in Rochester that have the potential to serve as storm water ambassadors, along with condominium and homeowner associations, developers, builders, and construction contractors. There are six neighboring entities that have also been identified as Phase II storm water permittees: Rochester, Haverhill, Cascade and Marion Townships, Olmsted County, and the Federal Medical Center. Depending on their program objectives, cooperative alliances are possible.

Compliance with existing storm water management ordinances has been mixed. Developer participation in the creation of on-site or regional storm water management ponds has been good. Installation and maintenance of adequate erosion control structures has been good for most contractors, but poor for some. As an understanding of these requirements has improved, so has compliance, however, loopholes exist in the current ordinances that will need to be addressed to improve storm water management.

In summary, watershed needs must be balanced with organizational and economic limitations to create a successful storm water management program that strives to protect water quality, serves Rochester residents, and meets permit requirements.

3.0 Overall Storm Water Management and Water Quality Philosophy

Rochester's Phase II storm water management permit goal is to restore and maintain the chemical, physical, and biological integrity of Rochester's water resources. The City intends to implement its storm water management program so

as to meet the requirements of the Phase II permit and its Storm Water Pollution Prevention Program (SWPPP). The City will also seek an adequate, equitable, and stable financing mechanism for its storm water management activities. The City's Flood Control Project goals and funding source are separate from its storm water management program. The Flood Control Project was designed and constructed to manage acute flooding and severe storm events. The storm water management program will deal with the chronic rate, quantity, conveyance, and water quality issues associated with urban storm water. In so doing, it will enhance aquatic and wildlife habitats and improve the urban environment to enhance the quality of life for its citizens.

4.0 Issues Related to Storm Water Management

The current condition of Rochester's water bodies varies throughout the City. In some areas, wetlands are already severely degraded (in many cases from past agricultural draining practices). In other areas, wetlands retain the valued unique, natural and ecosystem support classifications. Some creeks experience severe bank stabilization problems while others are intact and stable. Silver Lake, an existing artificial lake, is of poor quality due to overpopulation by geese and heavy sedimentation. Cascade Lake, an emerging artificial lake, currently has good water quality and is being designed to be sustainable for its intended recreational uses.

As previously mentioned, one reach of the South Fork of the Zumbro River through Rochester has been listed as impaired for *fecal coliform* bacteria and turbidity. *Fecal coliform* bacteria and sediment are therefore the primary pollutants of concern that will be given a higher priority during the Best Management Practice selection process.

Because large segments of Rochester's watercourses have been intentionally altered and are repeatedly dredged as part of its Flood Control Project, water quality improvements resulting from storm water management activities cannot be expected to result in habitat restoration along those reaches.

Using the Minimum Control Measure categories as the framework for evaluation, the following table presents an initial assessment of potential storm water management problems or issue areas. This appraisal was then considered along with the City's existing programs (Section 5.0) and the permit requirements to determine program gaps (Section 6.0). Program gaps were then evaluated to determine which are most needed and feasibly implemented to set future program priorities in Section 7.0.

MCM	Some Potential Problems/Issue Areas
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Category	
Public Education	<ul style="list-style-type: none"> ❑ Citizens know little about storm water pollution, how they contribute to it, or how they can help reduce it ❑ Few citizens or City staff know how to recognize or report a storm water problem ❑ There is little knowledge about why dumping pollutants into catch basins or streams is problematic ❑ Few information materials have been prepared ❑ There has been little public outreach ❑ The value placed on streams or other riparian areas is unknown ❑ A delineation between City and private property owner obligations is needed and level of service expectations need to be clarified ❑ The Environmental Corridor concept that is part of the Storm Water Management Plan needs to be more clearly communicated to planners, engineers, developers and decision makers ❑ Communications regarding regulations, policies, design specifications, and technical information need to be repeatedly communicated to developer, contractors, engineers and staff, especially when changes are implemented
Public Involvement	<ul style="list-style-type: none"> ❑ Citizens have had little opportunity for input into storm water policy since the development of the storm water management plan ❑ The level of citizen interest in this area is unknown ❑ Opportunities for citizens to get involved in storm water pollution reduction are limited ❑ Recruit citizens involved in local environmental and civic groups who have an interest in water quality issues to serve as volunteers (e.g., speakers, activity leaders, etc.)

<p style="text-align: center;">Illicit Discharges</p>	<ul style="list-style-type: none"> ❑ Non-storm water may be plumbed or dumped into drains, but the extent and impact are unknown ❑ Failing septic systems exist in older subdivisions that are now part of the City, but the Water Quality Protection Program is addressing this issue ❑ Outfall locations and conditions are generally unknown ❑ The locations of facilities with approved Industrial NPDES permits have not been identified ❑ Some citizens dump pollutants into catch basins or streams ❑ Surface water pollution originating from certain categories of dischargers (e.g., restaurants, gas stations, car washes, etc.) may be occurring, but the extent is unknown ❑ The City does not have a database showing the location of industrial facilities or the types of discharges that could be expected from each location. Similarly, the City does not have an inventory of sites with MPCA Industrial NPDES permits. The City does not have any specific storm water requirements for these facilities, nor is there a system in place to track complaints about industrial discharges or responses to complaints. Complaints are handled on a case-by-case basis. ❑ The City does conduct inspections of a few Industries for the purposes of sewage pre-treatment (by RWRP staff) and for hazardous materials permitting (handled by the Fire Department), but there is no referral mechanism in place for these entities to report possible illicit discharges to surface water. ❑ GIS mapping of the storm sewer system (pipes, manholes, catch basins, storm water ponds, and natural lakes and streams) is in progress, but it is not current and it does not include outfalls, as required under the permit. ❑ Tracking precipitation on a web site and setting guidelines to define a “dry weather” period for the purposes of illicit discharge detection and reporting would be useful. ❑ The City does not have an illicit discharge ordinance, nor does it have a tracking system for inspections, investigations, complaint responses or corrective actions. ❑ There are some “litter hotspots” near shopping centers and fast food restaurants but there is no specific program in place to target them for cleanup.
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<p>Construction Site Erosion & Sediment Control</p>	<ul style="list-style-type: none"> ❑ Erosion control practices and regulations are insufficient ❑ Channel erosion due to development occurs ❑ Storm water systems are sediment-clogged in some areas ❑ The number of staff responding to complaints and providing site inspections is insufficient ❑ Enforcement capabilities and practices are insufficient and inconsistent ❑ Some developers/contractors/builders/landscapers lack knowledge of erosion control practices and/or the desire to implement them ❑ Lack of locale-specific technical training on erosion control ❑ Site operators do not adequately control construction site wastes and debris, such as concrete truck washout, building waste, garbage, etc. ❑ Soils excavated during the construction of basements and foundations are often inappropriately wasted on site, changing approved grading plan elevations. ❑ Poor quality soil is often used as topsoil during the re-vegetation stage, which leads to seeding failures. Consideration should be given to preparing topsoil specifications.
<p>Post Construction Storm Water Management</p>	<ul style="list-style-type: none"> ❑ There are no parking lot sweeping requirements ❑ There are no specific development requirements for developments or areas draining to sinkholes ❑ Property owners don't understand that easements may not be obstructed ❑ Pond design standards need improvement with respect to eliminating under cutting by water action ❑ There is not a formal inventory of recurring drainage problem areas (they are known to be generally in areas where the storm sewer pipe is undersized or where the storm sewer outlets in railroad rights-of-way are plugged). To date, corrective actions are too expensive to pursue. ❑ Only a limited number of permanent control options to protect water quality are utilized ❑ Maintenance agreements are needed for private storm water facilities ❑ Acceptance and integration of innovative development concepts is cumbersome and time consuming and is hindered by lack of knowledge, existing regulations, current processes, and accepted practices ❑ Developer/engineer/builder/contractor/staff knowledge of storm water friendly design alternatives is limited ❑ A rapid-development mindset overshadows long-range environmental planning ❑ Storm water quantity control is inadequately addressed ❑ Riparian areas are inadequately vegetated to protect water quality ❑ A pollution-reduction incentive program is lacking ❑ Non-structural best management practices are uncommon
<p>Municipal Good Housekeeping</p>	<ul style="list-style-type: none"> ❑ Employees are unaware of pollution issues ❑ The Flood Control Project does not provide riparian vegetation best suited to reducing pollutant transport to the river ❑ City operations need to be audited to determine what additional practices are needed to prevent storm water pollution and non-storm water discharges from City-owned facilities. ❑ Consideration should be given to developing special grounds maintenance practices in areas located in floodplains or along waterways. ❑ Public pond maintenance procedures need to be written

Some Organizational Problems	
	<ul style="list-style-type: none"> ❑ Lack of stable & adequate funding (staff are obligated to multiple, competing priorities) ❑ Administrative leadership could be stronger with a more clearly articulated vision, particularly to gain support from Departments not traditionally involved in storm water management activities ❑ The level of public awareness, understanding, and/or involvement is unknown ❑ The assignment of storm water management responsibilities will be scattered throughout the organization making communication, accountability, and reporting a challenge ❑ Tracking plan reviews, permits, inspections, complaints, enforcement, etc. will need to be better integrated for program evaluation and permit reporting purposes.

5.0 Current Activities Used to Manage Storm Water

Historically, the City's storm water management goal was to prevent property damage from storm water by constructing a system to quickly convey it away from developed areas into area creeks and streams. Beginning in 1995, the City started a comprehensive surface water management planning process to integrate traditional planning for adequate conveyance infrastructure with water quality protection components. A 35-member Steering Committee comprised of business, residential, and government representatives guided this planning process. The Final Surface Water Management Plan was published in 1997, at which time construction of on-site and regional storm water management ponds was initiated. The Plan was amended in 1999 and renamed the Storm Water Management Plan (SWMP). That same year, the Zoning Ordinance and Land Development Manual were updated to incorporate the SWMP by reference. The SWMP is currently being amended to address storm water management in the future urban service areas of King's Run, Hadley Valley, and the Northwest Territory. Each successive SWMP has promoted a water quality – environmental corridor approach that, with time, is intended to provide a more ecologically integrated storm water management system.

Several related initiatives have impacted water resources management within the SZRW.

- Under the auspices of several 319 grants, Olmsted County has implemented many watershed-level initiatives over the past 15 years. These grants have supported activities ranging, for example, from baseline groundwater data gathering to trend assessment to storm water management pilot projects.
- Olmsted County is also responsible for preparing a Water Management Plan that, in part, addresses surface water management issues.
- A collaborative of nine southeast Minnesota Counties involved in water planning comprises the SE MN Water Resources Board.
- The Olmsted County Public Works Department has recently developed a South Zumbro River Storm Water Management Plan in conjunction with a Capital Improvement Project Plan that will direct the construction of future

storm water management ponds as a means to avoid costly bridge replacements. The South Zumbro Joint Powers Board, which was originally established to oversee the implementation of Rochester's Flood Control Project, has been temporarily reactivated to serve as the Policy Advisory Committee for this effort.

- The Minnesota Pollution Control Agency is leading the Basin Alliance for the Lower Mississippi in Minnesota (BALMM), primarily focusing on rural initiatives to protect water quality. The SZRW is within the Lower Mississippi River Basin.

At this time, there is no single organizational or funding structure that supports watershed-wide activities for the SZRW on a consistent, on-going basis.

The City has been implementing a number of storm water management activities for many years. The following list, organized by Minimum Control Measure categories, provides a brief overview of routine activities that are part of the existing storm water management program.

Public Education

- Respond to requests for presentations about storm water management
- Provide information to interested parties upon request

Public Involvement

- Assist with the ISD 535 "Summer of Service" youth program storm drain stenciling and stream monitoring projects
- Assist with a Zumbro River Cleanup Day conducted by local college Service Learning students, utilizing the DNR "Adopt A River" Program
- Citizen complaints (with responses by City staff on an as needed basis)

Illicit Discharges

- Complaint response
- Storm sewer and pond mapping
- As part of the Federal GASB34 requirement, the City is inventorying storm water ponds and sewers constructed during 2002 (by the end of 2005, the City must inventory all ponds and storm sewers within the City)
- Litter control in Parks through the Adopt-A-Park program
- Identification of illegal plumbing and drain connections by plumbing inspectors
- Acceptance of septic tank septage and RV waste by the Water Reclamation Plant
- The City video logs 430 miles of sanitary sewer each year to monitor for sewage leaks (the City averages only one sewer backup onto the ground each year from the public system; there are no known problems with sanitary waste exfiltration from the sanitary sewers to the surrounding environment)
- During hazardous material permit inspections, the Fire Department provides corrective action recommendations for identified illicit discharge problems to

the property owner (and in some cases, forwards concerns to RWRP or the MPCA

- The Fire Department responds to spills of hazardous materials and strives to contain spills to prevent the migration of the contaminants to the sewer system, surface water; and groundwater; they independently document the spills and provide for proper disposal of the spilled material and the materials used in the cleanup
- The County Solid Waste Division provides an integrated waste management system that is funded by waste generators; the County provides a Recycling Center, a materials reuse center, a Hazardous Waste Facility (for residents and Small Quantity Generators), a waste-to-energy facility, and a landfill
- Litter is a minor nuisance problem that is managed along with road dirt via the City's street sweeping activities; full-City sweeps are completed at least three times per year while the downtown business district is swept three times per week; City parking ramps are also swept (Rochester has one high performance vacuum sweeper which it uses in areas with sensitive water quality issues, like the downtown area near the Zumbro River)
- Implementation of the Water Quality Protection Project to replace failing septic systems with City sanitary sewer and water

Construction Site Erosion and Sediment Control

- Grading and drainage plan development, review and approval
- Inspection of construction sites greater than five acres for proper erosion control
- The City has erosion control regulations, but relies heavily on the MPCA NPDES Construction Permit program; education and corrective action are preferred over enforcement and penalties (other than withholding building permits) are rarely applied; inconsistency enforcement decisions are problematic
- The City relies on design criteria and technical standards for sediment and erosion control from sources such as the MPCA; temporary sedimentation ponds, silt fence, bale checks, erosion control blankets, and re-vegetation are the most common techniques applied

Post Construction Storm Water Management

- Preparation of technical specifications and construction of storm sewers and catch basins (or oversight of public storm sewers constructed by others)
- Response on as needed basis to localized flooding complaints and drainage problems to identify if long-term solutions are possible
- Acquisition of drainage easements where future work on private property will be needed
- The City requires that new development must adequately address storm water management (limiting discharge rates to predevelopment conditions), either through the construction of on-site ponds or by financial contribution to the regional storm water pond fund; the City references design criteria and

technical standards created by others, but principally those approved by the MPCA

- Stabilization of creeks and other drainage-ways
- Storm water management planning and special studies
- Development plan review
- Wetland delineations, restoration, and replacements
- Implementation of floodplain and shore land ordinances, participation in the national flood insurance program and FEMA's Community Rating System

Municipal Good Housekeeping

- City employees regularly apply pesticides, herbicides, and fertilizers to City lands but staff are trained and certified as applicators
- Routine parkland, building, vehicle maintenance
- Proper materials storage, including indoor salt storage
- Periodic dredging of the Flood Control Project (FCP) based on triggers set by the Army Corps of Engineers in the FCP Maintenance Manual
- Storm sewer inspection and maintenance/repair in public rights-of-way and driveway culvert cleaning is conducted on an as needed basis
- Roadside vegetation is managed by the Park Department on an as needed basis
- The City coordinates with MnDOT for maintenance of Broadway Avenue within the City (Hwy. 63)
- The City coordinates with Olmsted County on roadway drainage construction or problems on County roads within the City
- Inspection and maintenance of public detention ponds (which are most problematic shortly after construction and before the site is fully vegetated)
- A materials processing facility is being constructed as a site to process sediment from storm water pond maintenance, river dredging, and street sweepings
- Planned inspection, maintenance and repair of catch basins (about 300 per year) and ½ mile of ditch repair per year
- Washout repairs and storm sewer pipe cleaning occurs as discovered
- Staff are dispersed to known "hot spots" and throughout the City after storm events to quickly address drainage maintenance issues

Other

- Implementation of Industrial NPDES permits at the Airport, Silver Lake Power Plant, and the Water Reclamation Plant
- Record keeping

These activities should be maintained at current service levels as part of the Storm Water Pollution Prevention Program.

6.0 Gaps Between Current and Phase II Storm Water Programs

After comparing current programs to the new permit requirements, the following activities were identified as the primary additions needed to complement the existing storm water management program:

- Public education and participation
- Outfall mapping
- Routine pond and outfall inspections and maintenance
- Inspection of construction sites greater than one acre for proper erosion control
- Illicit discharge detection and elimination
- Update existing storm water ordinances,
- Develop ordinance to address illicit discharges
- Develop consistent enforcement procedures for storm water related ordinances
- Construction of water quality and quantity control structures to keep pace with development
- Improved materials management

The following suite of BMPs, by Minimum Control Measure category, was chosen to guide selection of BMPs for inclusion in the SWPPP to fill the program gaps identified above.

Best Management Practices to be Given Further Consideration for Inclusion in the SWPPP (Arranged by Minimum Control Measure)		
Public Education and Outreach BMP Ideas		
<input type="checkbox"/> Brochures <input type="checkbox"/> Videos <input type="checkbox"/> Slide shows <input type="checkbox"/> Speakers bureau <input type="checkbox"/> News articles <input type="checkbox"/> Billing inserts <input type="checkbox"/> Pet waste bags <input type="checkbox"/> Coalition-building with other MS4s and water resource agencies	<input type="checkbox"/> School curriculum <input type="checkbox"/> Adopt-a-stream <input type="checkbox"/> Storm drain stencils <input type="checkbox"/> Door Hangers <input type="checkbox"/> Fact sheets <input type="checkbox"/> Web sites <input type="checkbox"/> Posters <input type="checkbox"/> Restaurant place mats <input type="checkbox"/> T-shirts or caps with storm water message for staff or volunteers	<input type="checkbox"/> Special staff training programs <input type="checkbox"/> Incentive programs <input type="checkbox"/> Watershed, tributary or CIP project signage <input type="checkbox"/> Guides targeted to specific groups, such as Developers, Engineers, Contractors, Utilities, Builders, Residents, Car Washes, etc. <input type="checkbox"/> Displays
Public Participation/Involvement BMP Ideas		
<input type="checkbox"/> Annual Public Hearing <input type="checkbox"/> Citizen's groups (possibly the Committee on Urban Design and Environment) <input type="checkbox"/> Volunteer speakers bureau to respond to service club and youth group requests	<input type="checkbox"/> Local volunteers participating in the MPCA Citizen Volunteer Stream Monitoring <input type="checkbox"/> RCTC Service Learning students participation in the DNR Adopt a Stream program	<input type="checkbox"/> ISD 535 Children's Water Festivals <input type="checkbox"/> ISD 535 Summer of Service Program (Storm drain stenciling and River Monitoring)
Illicit Discharge Detection and Elimination BMP Ideas		

<ul style="list-style-type: none"> <input type="checkbox"/> System mapping on GIS including outfalls and watershed boundaries <input type="checkbox"/> GIS database of NPDES permitted industries <input type="checkbox"/> ASIST database management of complaints received and actions taken <input type="checkbox"/> Fire department referrals from routine industry inspections <input type="checkbox"/> Plan to detect and address illicit discharges 	<ul style="list-style-type: none"> <input type="checkbox"/> Student dry weather screening <input type="checkbox"/> Complaint database <input type="checkbox"/> Ordinance controls <input type="checkbox"/> Site inspections <input type="checkbox"/> Continue Water Quality Protection Program to replace failing septic systems with City sanitary sewer services <input type="checkbox"/> Video sanitary sewers as a preventative maintenance activity 	<ul style="list-style-type: none"> <input type="checkbox"/> Storm drain stenciling <input type="checkbox"/> Brochures and other outreach and education materials (see first two minimum controls) <input type="checkbox"/> Training for public employees <input type="checkbox"/> County Recycling programs <input type="checkbox"/> County Hazardous Waste Facility and Reuse Center <input type="checkbox"/> Video storm sewers as necessary to evaluate maintenance needs
Construction Site Runoff Control BMP Ideas		
<ul style="list-style-type: none"> <input type="checkbox"/> Ordinance <input type="checkbox"/> BMP and site planning training <input type="checkbox"/> Mandatory E&S plans <input type="checkbox"/> Training videos with notes and exercises 	<ul style="list-style-type: none"> <input type="checkbox"/> Plan review checklists <input type="checkbox"/> Cross train building inspectors <input type="checkbox"/> Timed or milestone-based inspections <input type="checkbox"/> Recordkeeping 	<ul style="list-style-type: none"> <input type="checkbox"/> Bonding requirements <input type="checkbox"/> Building inspection holds for non-compliance <input type="checkbox"/> Complaint tracking program and database
Post-Construction Runoff Control BMP Ideas		
<ul style="list-style-type: none"> <input type="checkbox"/> Review zoning ordinances and Land Development Manual to identify barriers and incentives for conservation site design practices <input type="checkbox"/> Open space planning <input type="checkbox"/> Create specifications for post-construction vegetation on City construction projects <input type="checkbox"/> Transition to native, lower-maintenance plantings in storm water management areas, and other parklands, as appropriate <input type="checkbox"/> Complete a stream bank evaluation to prioritize stabilization needs 	<ul style="list-style-type: none"> <input type="checkbox"/> Review additional BMP options to expand the list of types most acceptable to the City, including low impact development options, infiltration or volume control techniques, and designs that minimize nuisance wildlife and disease vectors (e.g., geese and mosquitoes) <input type="checkbox"/> Continue storm water management planning, as the City expands <input type="checkbox"/> Better site design guidance and ordinances 	<ul style="list-style-type: none"> <input type="checkbox"/> Execute mandatory maintenance agreements with owners of private infrastructure components <input type="checkbox"/> Conduct post-construction BMP inspections <input type="checkbox"/> Credit program for implementation of structural or non-structural BMPs that reduce the City's storm water management burden, such as low impact development designs, impervious area reduction, or maintenance of private ponds. <input type="checkbox"/> Identification and acquisition of lands in key locations for regional storm water ponds
Pollution Prevention/Good Housekeeping BMP Ideas		
<ul style="list-style-type: none"> <input type="checkbox"/> Maintenance program and procedures assessment <input type="checkbox"/> Materials handling and storage assessment <input type="checkbox"/> Street and parking lot sweeping with high efficiency sweepers 	<ul style="list-style-type: none"> <input type="checkbox"/> Materials processing facility development to manage sediment from ponds, ditches and flood control dredging spoils 	<ul style="list-style-type: none"> <input type="checkbox"/> Materials storage assessment <input type="checkbox"/> Comprehensive review and modification of all municipal outdoor operations <input type="checkbox"/> Employee training <input type="checkbox"/> Inspection of public sites
Other Organizational Related BMP Ideas		

<input type="checkbox"/> Identify mechanisms to foster program support throughout City organization <input type="checkbox"/> Develop clear service response guidelines and communicate them to Administration, Council members, and staff,	<input type="checkbox"/> Formalize a customer response procedure, identifying initial intake responsibilities, distribution to the appropriate service provider, and documentation of actions taken.	<input type="checkbox"/> Evaluate organizational structure of staff responsible for implementing storm water management activities and create effective internal communications and accountability strategy <input type="checkbox"/> Amend job descriptions to clarify storm water management related responsibilities
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7.0 Future Storm Water Management Priorities

Since it would be unrealistic to target all the potential problem areas as new tasks to be addressed under the permit due to budget and staffing limitations, it will be necessary for the City to identify the most prevalent issues that should be considered as priorities during the first permit term. They can be summarized as follows:

- Effort is needed to seek stable and equitable financing mechanisms to adequately fund the storm water management program.
- There is a general lack of awareness about storm water management and water quality issues along with an absence of knowledge regarding what actions can be taken to improve water quality.
- Outfall mapping and an organized illicit discharge detection and elimination system
- Routine pond and outfall inspections and maintenance
- Ordinances and specifications need strengthening and development to meet the Phase II permit goals and ordinance enforcement procedures need to be clarified. In particular, erosion and sediment control is a continuing problem especially on individual lot construction and when utilities are installed. Maintaining elevations identified on approved grading plans is also problematic, generally as a result of individual lot construction activities.
- Construction of water quality and quantity control structures, with a focus on reducing the backlog of planned capital improvement projects (especially the construction of regional ponds to serve recently developed areas for which financial contributions have already been made)
- Inspection of construction sites greater than one acre for proper erosion control.
- City operations need to be evaluated to determine their storm water management impacts. Subsequent training will be needed to improve operational practices and to help City employees become community role models.

Additional consideration should be given to the process used to drive implementation of Best Management Practices. Currently, the SWMP is used as a guidance document, but BMP selections are generally made on a

development-by-development basis. Further effort is needed to integrate additional environmental protection criteria into the selection process, such as the condition of a water body, the pollutant loading impact of certain land uses or activities, or the opportunity to locate facilities in already developed areas. Volume control options also need to be studied as well as pond designs that hinder nuisance wildlife and disease vector populations.

Summary

The City is facing a critical juncture of extreme budget reductions juxtaposed against rapid population growth that is driving increasing service demands in all areas, including the storm water management arena. The newly mandated Phase II Storm Water permit adds to that burden. Lack of adequate funding and staffing will force the City to balance the desirable water quality protection goals of the Permit with realistically achievable and economically feasible choices. Accordingly, the SWPPP scope and sequence will focus on meeting the minimum Permit requirements, with the intent to add key elements over time as resources allow.